

Demonstration of adjustable fluidic lens in microgravity

Problem Statement

- A high-performance adjustable fluidic lens has been designed to function in variable gravity environments, providing potential alternatives for NASA optical systems
- A parabolic flight will allow validation of fluidic lens performance under the influence of a varied gravitational environment
- Such a fluidic lens could be used in space-based optical systems for focus adjustment

Technology Development Team

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Proposed Flight Experiment

Experiment Readiness:

- Early 2013

Test Vehicles:

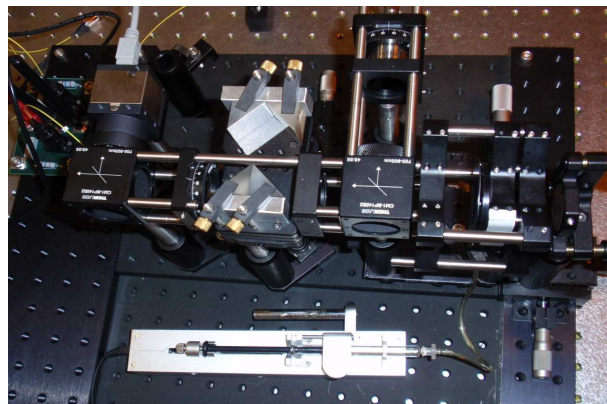
- G-Force One, Zero Gravity Corporation

Test Environment:

- This technology has not previously flown in a relevant environment, so this campaign will be the first opportunity to characterize its performance.

Test Apparatus Description:

- The test setup includes an optical rail that holds the fluidic lens, a low-power infrared diode, and a wavefront sensor (pictured below):



Technology Maturation

- Technology is currently TRL 4
- (2013) TRL 5 will be achieved after parabolic flight validates theoretical performance at a component level
- (2014) TRL 6 expected to be achieved in follow-on suborbital flight of integrated fluidic optical system

Objective of Proposed Experiment

- Validate fluidic lens performance in a variable gravity environment
- Obtain wavefront data to fully characterize component behavior as a function of gravity
- Flight data will help determine future refinement needed to mature technology further

Technology Area addressed by this technology: TA08 Science Instruments, Observatories and Sensor Systems